

PREVALENCE OF ANAEMIA IN CHHATTISGARH: ANALYZING CAUSES & ROLE OF INDIGENOUS**Astha Sharma, Khushboo Gupta*, Sandip Prasad Tiwari****Faculty of Pharmacy, Kalinga University, Naya Raipur, Chhattisgarh India (492101)***Corresponding Author's E mail: khushboo.gupta@kalingauniversity.ac.in

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ABSTRACT

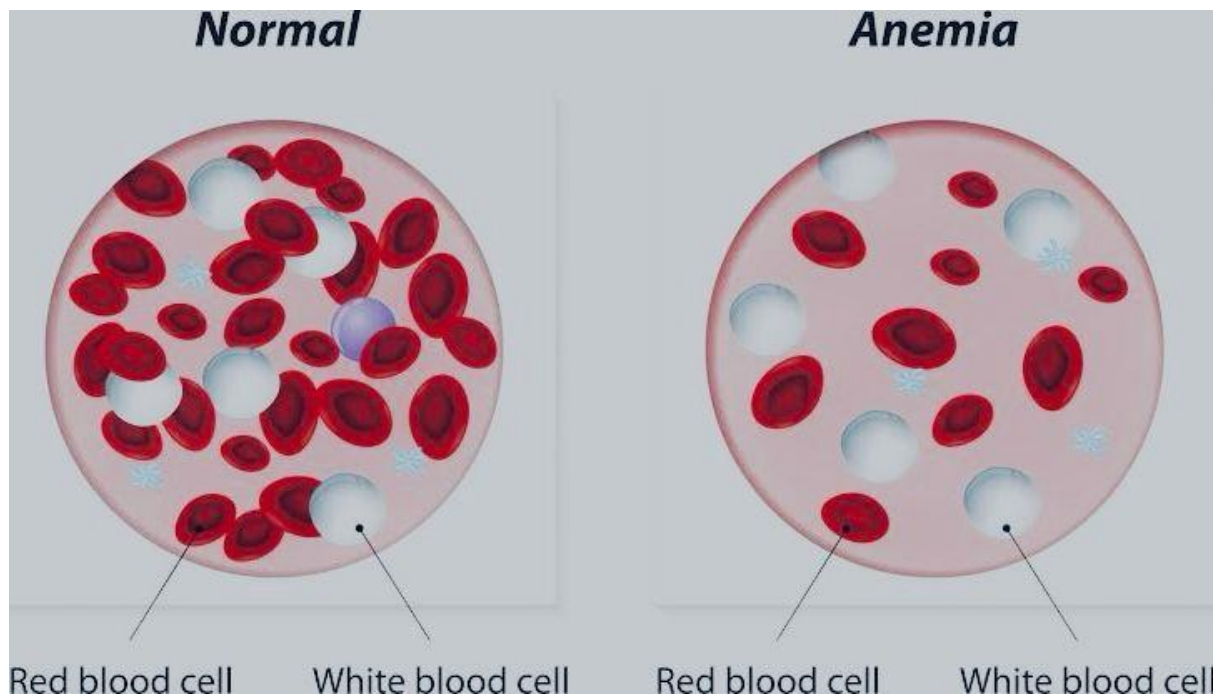
Anaemia continues to be a significant public health issue in India, particularly in Chhattisgarh, which has one of the highest rates of prevalence. According to NFHS-5 (2019-21), the rate of Anaemia among children aged 6-59 months increased from 41.6% (NFHS-4) to 67.2%, while more than 60% of women of reproductive age are impacted. The extensive burden in Chhattisgarh is related to deficiencies in nutrition, poverty, limited variety in diets, genetic disorders such as sickle cell Anaemia, and insufficient access to healthcare services. Moreover, environmental factors like iron-deficient soil and inadequate water quality exacerbate the problem by decreasing the iron levels in food cultivated locally. Despite the presence of iron and folic acid supplementation initiatives, obstacles such as poor adherence, low absorption rates, and side effects challenge their effectiveness. This situation has led to growing interest in the use of traditional herbal medicines among tribal and rural populations in Chhattisgarh. This review examines the contributions of medicinal plants such as *Moringa oleifera* (Sahjan), *Phyllanthus emblica* (Amla), *Tinospora cordifolia* (Guduchi), *Terminalia arjuna* (Arjuna), *Boerhavia diffusa* (Punarnava), and *Andrographis paniculata* (Kalmegh) in the management of Anaemia. These plants, which are abundant in bioactive compounds like flavonoids, alkaloids, tannins, and polyphenols, support iron absorption, enhance haemoglobin levels, and promote overall blood health.

Keywords: Anaemia, Traditional, Topical treatments, Haemoglobin.

1. Introduction

Anaemia is a major global health concern that occurs when there is an insufficient number of healthy red blood cells or haemoglobin in the body, which is vital for oxygen transport to different tissues. This condition can occur due to a lack of essential nutrients such as iron, vitamin B12, and folic acid, and can also result from chronic infections, parasitic infestations, genetic disorders like sickle cell disease and thalassemia, as well as inflammatory diseases. The condition disproportionately impacts women, children, and populations with low socioeconomic status, leading to serious effects such as fatigue,

cognitive decline, weakened immune response, decreased physical stamina, and heightened risk of maternal and infant mortality¹.



The World Health Organization (WHO) deems Anaemia a serious public health concern when its prevalence exceeds 40% within any specific population, making it a widespread issue in developing nations, especially in India. The implications of Anaemia go beyond personal health, significantly affecting economic output, as those affected often experience decreased work efficiency and a reduced quality of life².

2. Anaemia Rates in Chhattisgarh Compared to Other States

India bears one of the highest Anaemia burdens globally, especially among women and children, attributed to widespread nutritional deficits, limited healthcare access, and socioeconomic inequalities. The National Family Health Survey (NFHS-5), conducted from 2019 to 2021, revealed a concerning rise in Anaemia prevalence across the nation compared to NFHS-4 (2015-16), underscoring the escalating Anaemia crisis in numerous states, including Chhattisgarh³.

In Chhattisgarh, the prevalence of Anaemia in children aged 6 to 59 months escalated from 41.6% in NFHS-4 to 67.2% in NFHS-5, placing it among the states with the highest rates of Anaemia in India. Additionally, the prevalence of Anaemia among women of reproductive age (15–49 years) saw a significant rise, with 66.3% of non-pregnant women and 61.8% of pregnant women affected. These

troubling statistics point to a growing public health emergency that demands prompt attention from policymakers, healthcare experts, and researchers⁴.

Relative to other states, the Anaemia crisis in Chhattisgarh is particularly acute. Although states such as Gujarat (79.7%), Assam (68.4%), and Madhya Pradesh (72.7%) also report elevated childhood Anaemia rates, Kerala (39.4%) and Haryana (70.4%) present lower yet still concerning figures. The high Anaemia prevalence in Chhattisgarh stems from various factors, including poverty, food insecurity, dependence on iron-deficient staple foods, lack of dietary diversity, and chronic parasitic infections. Moreover, genetic aspects, including the significant incidence of sickle cell Anaemia in tribal populations, further worsens the situation⁵.

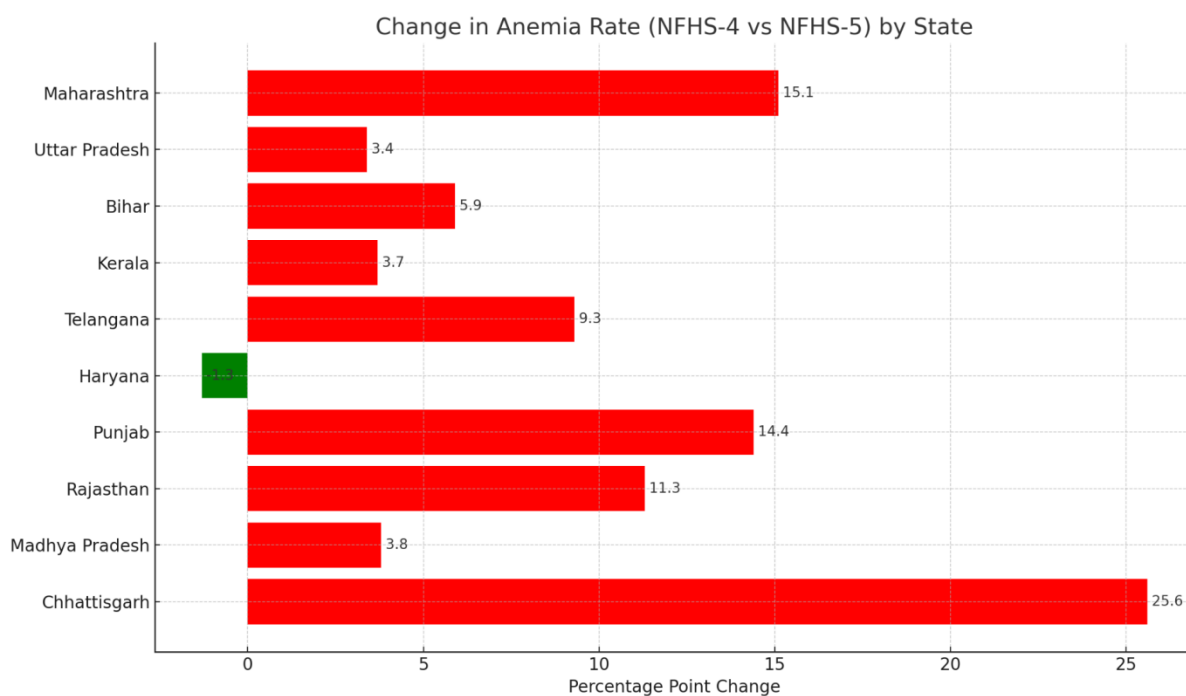


Figure 1: Socioeconomic and Environmental Factors Contributing to Anaemia in Chhattisgarh

Chhattisgarh hosts a large tribal population, many of whom live in remote regions where they have limited access to healthcare and necessary nutritional resources ((Let, S., et al., 2024)). Low literacy rates, gender inequalities, and a lack of awareness about nutritional needs contribute to the elevated levels of Anaemia among women and children. The reliance on traditional diets that are high in carbohydrates but low in iron, protein, and key micronutrients exacerbates iron deficiency in these communities⁶.

Environmental factors significantly contribute to the Anaemia crisis in Chhattisgarh. Iron-poor soil and substandard water quality result in low iron levels in crops grown locally, making it difficult for communities to achieve sufficient iron intake through their diets. Additionally, recurrent incidents of waterborne illnesses and parasitic infections, such as hookworm and malaria, heighten the risk of Anaemia by causing ongoing blood loss and hindering iron absorption. The absence of fortified food initiatives and limited healthcare measures further impede efforts to lower Anaemia rates⁷.

Table 1: Traditional and Indigenous Herbal Remedies for Anaemia in Chhattisgarh

Anaemia Rate Change			
State	NFHS-4 (2015-16)	NFHS-5 (2019-21)	Percentage Point Change
Chhattisgarh	41.60%	67.20%	25.6
Madhya Pradesh	68.90%	72.70%	3.8
Rajasthan	60.30%	71.60%	11.3
Punjab	56.60%	71.00%	14.4
Haryana	71.70%	70.40%	-1.3
Telangana	60.70%	70.00%	9.3
Kerala	35.70%	39.40%	3.7
Bihar	63.50%	69.40%	5.9
Uttar Pradesh	63.00%	66.40%	3.4
Maharashtra	53.80%	68.90%	15.1

Despite the fact that iron and folic acid supplements, dietary enhancements, and public health initiatives are the primary methods for addressing anemia, traditional medicine plays a vital role, particularly in tribal and rural regions where access to modern medical care is limited⁸. Chhattisgarh, known for its abundant biodiversity and established traditional healing methods, has a long history of herbal remedies, with local healers and indigenous communities depending on medicinal plants to address various health issues, including anemia^{9, 10}.

These plants possess bioactive compounds such as flavonoids, alkaloids, tannins, saponins, and polyphenols, which have been researched for their ability to support blood production, enhance iron absorption, and contribute to increased red blood cell formation¹¹. Ethnobotanical research has

identified numerous local herbs in Chhattisgarh utilized for managing anemia, showcasing their nutritional benefits and medicinal value¹².

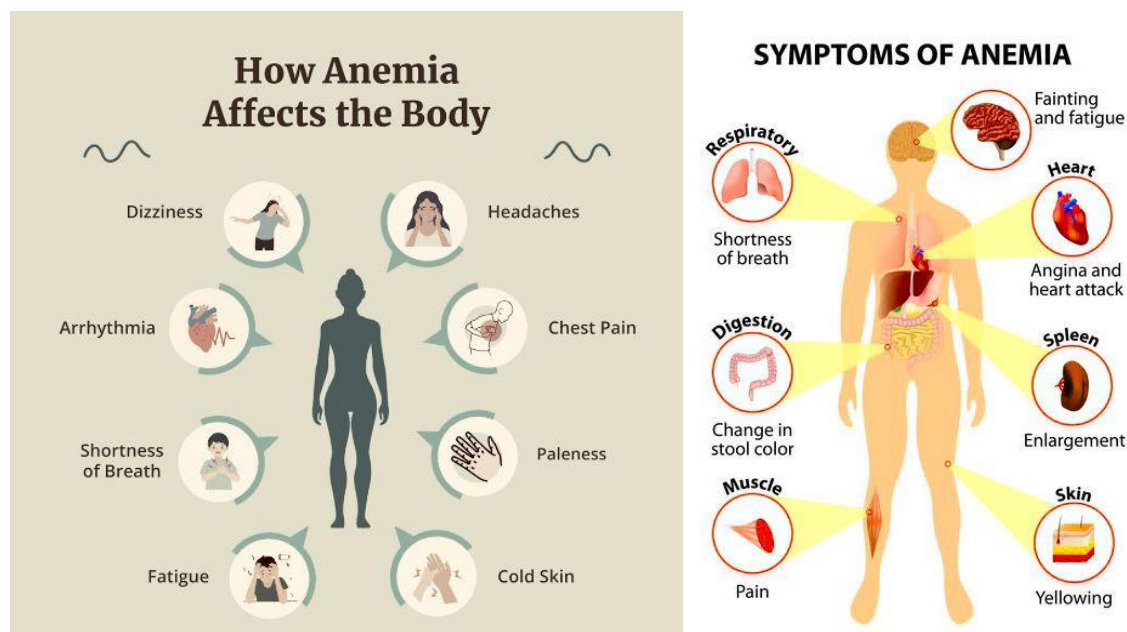


Figure 2: Frequently Utilized Indigenous Flora for Managing Anemia in Chhattisgarh

1. *Moringa oleifera* (Sahjan)

Moringa, often referred to as the "miracle tree," is renowned for its remarkable nutritional benefits. It is abundant in iron, vitamin C, calcium, and essential amino acids, which aid in boosting hemoglobin levels and improving overall nutrition. The substantial amount of vitamin C found in Moringa greatly enhances iron absorption, making it an effective natural remedy for iron deficiency anemia¹³. The leaves and pods of Moringa can be eaten raw, cooked, or as a dried powder in traditional meals, and its extracts are incorporated into Ayurvedic remedies to promote the production of red blood cells¹⁴.

2. *Phyllanthus emblica* (Amla)

Amla, also known as Indian gooseberry, is one of the highest sources of vitamin C, which plays a vital role in increasing the bioavailability of iron from plant-based foods. The absorption of iron from vegetarian diets can be inhibited by the presence of antinutritional factors, but the vitamin C in Amla is instrumental in transforming non-heme iron into its more absorbable form, consequently lowering the risk of iron deficiency anemia¹⁵. In Chhattisgarh, Amla juice, dried powder, and herbal decoctions are often utilized to enhance immunity and improve blood quality, particularly for pregnant women and children with anemia¹⁶.

3. *Tinospora cordifolia* (Guduchi)

Guduchi, also known as Giloy, is a potent herb with hematopoietic properties, recognized for its ability to modulate the immune system and reduce inflammation¹⁷. Research indicates that Guduchi promotes the formation of red blood cells by stimulating the bone marrow, making it effective for treating anemia caused by chronic infections and inflammatory conditions¹⁴. It is commonly consumed as a herbal infusion or decoction in tribal areas of Chhattisgarh to alleviate fatigue, raise hemoglobin levels, and boost immune function¹⁸.

4. *Terminalia arjuna* (Arjuna)

Traditionally known for its benefits to cardiovascular health, Arjuna bark possesses vasodilatory and circulatory-enhancing characteristics that can improve blood flow and hemoglobin levels. The antioxidants and essential minerals, including iron and zinc, found in Arjuna bark play a role in enhancing oxygen transport in the bloodstream, which can help reduce fatigue and weakness associated with anemia. In Ayurvedic practice, a combination of Arjuna bark powder with honey or milk is often recommended for individuals suffering from chronic anemia and heart-related issues¹⁹.

5. *Boerhavia diffusa* (Punarnava)

Punarnava is acknowledged for its diuretic, liver-protective, and blood-building properties, making it an essential medicinal plant in traditional Ayurvedic and tribal practices. The herb's ability to enhance iron levels is linked to its high content of flavonoids and alkaloids, which contribute to stimulating erythropoiesis (the production of red blood cells) and improving the synthesis of hemoglobin²⁰. The root extracts and decoctions of Punarnava are commonly employed by tribal communities in Chhattisgarh to address iron deficiency anemia, alleviate water retention, and support liver health, thus improving iron metabolism²¹.

6. *Andrographis paniculata* (Kalmegh)

Kalmegh, known as the "King of Bitters," is prized for its properties that boost immunity, reduce inflammation, and protect the liver. Studies reveal that Kalmegh assists in alleviating anemia-related fatigue by promoting the production of red blood cells and enhancing liver function, which is essential for effective iron metabolism. This plant is commonly used in herbal drinks, extracts, and powders to strengthen the immune system and improve overall vitality in individuals with anemia²².

Chhattisgarh's rich heritage of herbal medicine offers a valuable and natural approach to managing anemia, especially in tribal and rural communities where access to conventional treatments may be

limited. These native medicinal plants have been utilized for generations and continue to be crucial in anemia treatment by improving iron absorption, promoting the production of red blood cells, and increasing hemoglobin levels. Scientific research has affirmed the therapeutic properties of numerous herbs, positioning them as viable options for integrative strategies in addressing anemia²³.

While their potential benefits are encouraging, additional clinical trials and pharmacological investigations are necessary to determine standardized dosages and formulations for wider medical application²⁴. Merging traditional knowledge with contemporary scientific research may pave the way for developing effective, affordable, and sustainable treatments for anemia, particularly in resource-constrained environments such as Chhattisgarh²⁵.

CONCLUSION

Anemia continues to pose a significant public health issue in India, with Chhattisgarh ranking among the most severely impacted states. This review reveals that the anemia prevalence in children aged 6–59 months rose from 41.6% (NFHS-4) to 67.2% (NFHS-5), while over 60% of women of reproductive age are similarly affected. In contrast to other states, Chhattisgarh suffers from exceptionally high anemia rates, especially in tribal and rural demographics, attributed to factors such as malnutrition, poverty, limited dietary diversity, genetic conditions like sickle cell anemia, and insufficient access to healthcare. Moreover, iron-deficient soil and subpar water quality further diminish dietary iron intake, intensifying the crisis. This review highlights the importance of combining traditional herbal medicine with modern medical practices to create cost-effective and sustainable approaches for managing anemia. Future investigations should concentrate on pharmacological evaluations, bioavailability research, and extensive clinical trials to integrate these remedies into conventional healthcare. Additionally, public health efforts should emphasize nutritional education, dietary enhancements, and agricultural policies to improve access to iron-rich foods. A comprehensive approach that merges scientific study, traditional medicine, and healthcare reform will aid in combating anemia, advancing public health, and improving the well-being of communities affected in Chhattisgarh.

REFERENCES

1. World Health Organization. Anaemia in women and children. Geneva: WHO; 2023.
2. World Health Organization. Anaemia. Geneva: WHO; 2024.
3. International Institute for Population Sciences (IIPS) and ICF. National Family Health Survey (NFHS-5), 2019-21: India. Mumbai: IIPS; 2021.

4. Kumar A, et al. Prevalence and determinants of anaemia among women of reproductive age in India: A cross-sectional study using NFHS-5 data. PLoS One. 2023;18(1): e0280000.
5. Sinha A, et al. Trends in prevalence and predictors of anemia in adolescents between the ages of 15 and 19 years in India and its states: Evidence from the National Family Health Survey (2015-16 and 2019-21). Cureus. 2024;16(1): e286481.
6. Chakravarty M, Venugopal R, Chakraborty A, Mehta SK, Varoda A. A study of nutritional status and prevalence of anaemia among the adolescent girls and women of reproductive age of Baiga tribe accessing antenatal clinic in public health sector in Chhattisgarh, India. Res J Pharm Technol. 2022;15(2):598-604.
7. Saha J, Sarkar D. Prevalence of iron deficiency and iron deficiency anaemia among nursing students of Bilaspur, Chhattisgarh. Int J Med Res Rev. 2015;3(7):738-742.
8. Varoda A, Chakravarty M, Venugopal R, Kumar A. Prevalence of anaemia among adolescent girls of Baiga (PVTGs) of Chhattisgarh, India. Hum Biol Rev. 2021;10(2):129-139.
9. Chakravarty D, Venugopal G. Anemia prevalence among Baiga tribal women of Chhattisgarh. J Tribal Health. 2020;4(1):34-42.
10. Dubey V. Exploring indigenous knowledge medicinal plants: Appraisal. In: Agrawal SC, Pati RN, editors. Addressing anemia: A systematic review on prevalence, causes, and management. J Med Sci. 2025;7(1):7-13.
11. Sinha S, et al. The impact of Moringa oleifera supplementation on anemia and nutritional status in women: A randomized controlled trial. J Nutr Health. 2023;12(3):150-158.
12. Gupta R, et al. Amla (Phyllanthus emblica L.) enhances iron dialysability and uptake in in vitro models. Curr Sci. 2015;108(11):1970-1974.
13. Sharma P, et al. Beneficial effects of Tinospora cordifolia on blood profiles in male mice. J Ethnopharmacol. 2020; 250:112470.
14. Kumar S, et al. Terminalia arjuna bark powder as a potential immunomodulator in fish: A study on Labeo rohita. Aquac Rep. 2024; 25:100567.
15. Patel S, et al. Boerhavia diffusa: A review on its phytochemical and pharmacological profile. J Pharmacogn Phytochem. 2022;11(2):123-129.
16. Singh R, et al. Andrographis paniculata: A review on its phytochemistry and pharmacological activities. J Ethnopharmacol. 2021; 274:114054.
17. Verma A, et al. Moringa oleifera: An updated comprehensive review of its phytochemistry and pharmacology. J Med Plants Res. 2023;17(5):101-110.

18. Kumar A, et al. Functional and nutraceutical significance of amla (*Phyllanthus emblica* L.): A review. *J Food Sci Technol*. 2022;59(3):1031-1040.
19. Sharma N, et al. Evaluation of hematological effect of *Tinospora cordifolia* in mice. *Int J Curr Res*. 2023;15(6):190-195.
20. Mehta R, et al. Revisiting *Terminalia arjuna* – An ancient cardiovascular drug. *J Tradit Complement Med*. 2023;13(1):12-20.
21. World Health Organization. Prevalence of anaemia in children under 5 years (%). Geneva: WHO; 2021.
22. World Health Organization. Prevalence of anaemia in women of reproductive age (%). Geneva: WHO; 2021.
23. Patel M, et al. Anaemia in India and its prevalence and multifactorial aetiology. *J Clin Diagn Res*. 2024;18(2): OE01-OE05.
24. Kumar R, et al. Anaemia prevalence and socio-demographic factors among women in India: Analysis of NFHS-5 data. *J Public Health*. 2025;47(1):e10-e15.
25. Sharma V, et al. Addressing anemia: A systematic review on prevalence, causes, and management. *J Med Sci*. 2025;7(1):7-13.